FREE REVISION PACK

Photoelectric Effect

Pearson Edexcel International Advanced Level Physics · Unit 2 (WPH12) · Specification points 59–62

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Definition of threshold frequency	Edexcel IAL June 2024 · Unit 2 · Q6	1 mark
2	Easy	Evidence for the photon model	Edexcel IAL January 2021 · Unit 2 · Q4	1 mark
3	Easy	What affects photoelectric emission	Edexcel IAL June 2025 · Unit 2 · Q9	1 mark
4	Easy	An observation of the photoelectric effect	Edexcel IAL January 2020 · Unit 2 · Q6	1 mark
5	Easy	Planck constant from a graph of 1/λ against KE	Edexcel IAL June 2024 · Unit 2 · Q10	1 mark

Key ideas to have ready

- Einstein's equation: $hf = \varphi + \frac{1}{2}mv^2_{max}$.
- Threshold frequency $f_0 = \varphi/h$: the minimum frequency that releases electrons.
- Frequency sets the maximum KE; intensity sets the number of electrons per second.
- Emission is instant: evidence for photons (the particle nature of light).

How to use this pack

1. The questions are grouped into levels (Easy). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in Pearson's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–5

Choose **one** answer for each question and put a cross in the box next to it.

Edexcel IAL June 2024 · Unit 2 · Q6

1 Which of the following describes threshold frequency?

- ☒ **A** The frequency of light that causes photoelectrons to have maximum kinetic energy.
- ☒ **B** The frequency of light emitted when excited electrons fall to the ground state.
- ☒ **C** The minimum frequency of light that can cause an electron to leave a surface.
- ☒ **D** The maximum frequency of light which excites an electron in the ground state.

Edexcel IAL January 2021 · Unit 2 · Q4

2 Electromagnetic radiation can be described in terms of a photon model.

Which of the following demonstrates the photon model of light?

- ☒ **A** diffraction patterns
- ☒ **B** Huygens' construction
- ☒ **C** photoelectric effect
- ☒ **D** plane polarisation

Edexcel IAL June 2025 · Unit 2 · Q9

3 When monochromatic light is incident on the surface of a metal, photoelectrons are emitted.

Which of the following statements is correct?

- ☒ **A** The maximum kinetic energy of the photoelectrons depends on the intensity of the incident light.
- ☒ **B** The number of photoelectrons emitted per second depends on the frequency of the incident light.
- ☒ **C** The maximum kinetic energy of the photoelectrons depends on the frequency of the incident light.
- ☒ **D** The number of photoelectrons emitted per second depends on the work function of the metal.

Edexcel IAL January 2020 · Unit 2 · Q6

4 When the photoelectric effect occurs, light incident on the surface of a metal releases electrons.

Which of the following is an experimental observation of the photoelectric effect?

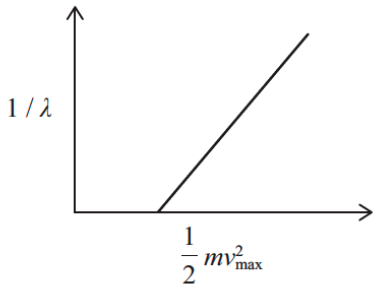
- ☒ **A** Electrons are only released after light has been incident for a long time.
- ☒ **B** Increasing the frequency of the light increases the maximum kinetic energy of the released electrons.
- ☒ **C** Increasing the intensity of the light increases the maximum kinetic energy of the released electrons.
- ☒ **D** Only light with a wavelength above a threshold value releases electrons.

Edexcel IAL June 2024 · Unit 2 · Q10

5 Light of wavelength λ travelling at speed c is incident on a metal surface.

Photoelectrons are emitted from the surface with a maximum kinetic energy $\frac{1}{2}mv_{max}^2$.

The graph shows the relationship between $1/\lambda$ and $\frac{1}{2}mv_{max}^2$.



Which of the following shows how the gradient of the graph can be used to determine the Planck constant h?

☒ **A** $h = \frac{1}{\text{gradient}}$

☒ **B** $h = \frac{1}{\text{c} \times \text{gradient}}$

☒ **C** $h = \frac{\text{c}}{\text{gradient}}$

☒ **D** $h = \text{gradient}$

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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